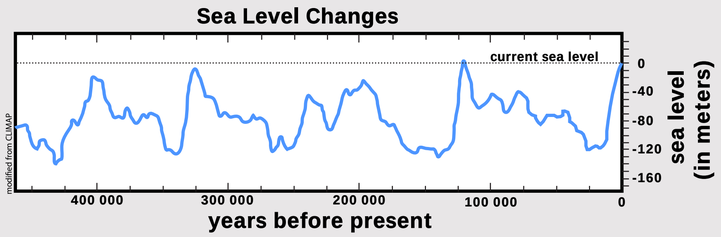
# Caves of Waikouaiti

Sea caves are common along the Waikouaiti coast and form where wave energy erodes the rock along vertical fractures. Most of these caves are very active and require considerable experience and rare sea conditions to visit safely. However, one cave shown below is at +4m elevation and is dry. This cave has been popular with visitors since the late 1800s. Many have left their name in the cave walls or "souvenired" a stalagmite. Today the cave is of special interest to scientists.

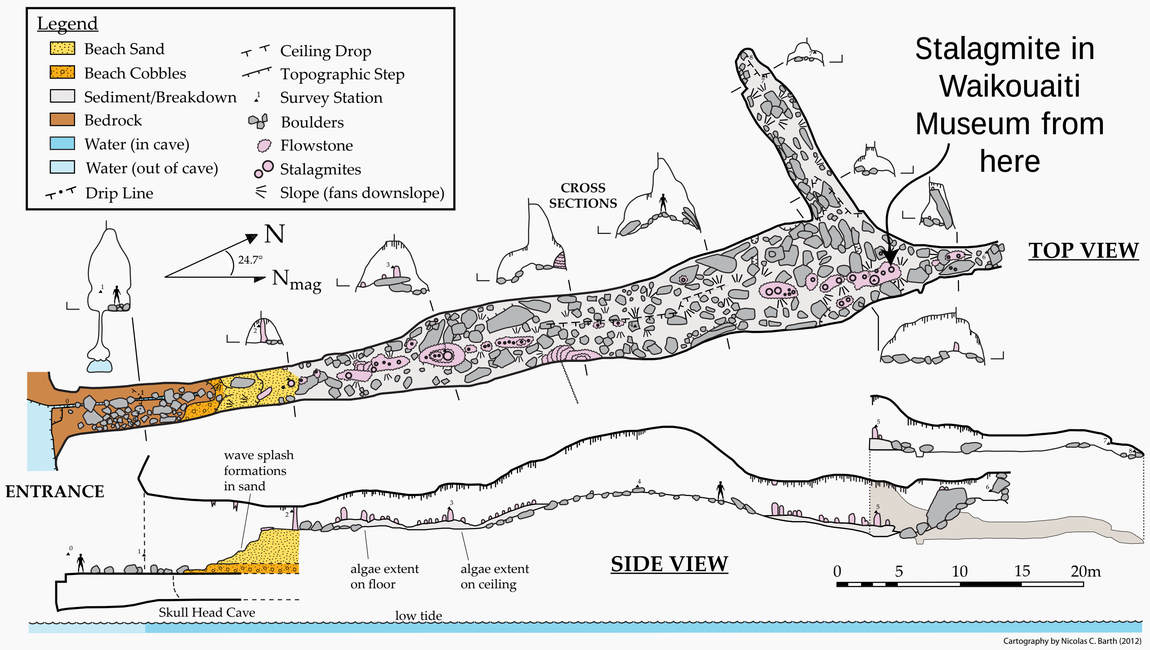



Sea level has varied through time depending on how much water is locked up in glaciers and ice sheets. About 20 000 years ago sea level was at -120m and the coastline near Waikouaiti would have been about 40km to the east! Sea level was last at +4m 120 000 years ago, so if there has not been significant uplift of the coast since, then this is when the cave was abandoned by the sea. The stalagmites growing on the cave floor must be younger.

## What 100 years looks like



Below: A detailed map of the cave. Notice the active sea cave directly below.




## What thousands of years look like

Stalagmites like the one in front of you can be great records of past climate. A temperature and humidity recorder was placed at the back of the cave at Waikouaiti for several months through winter taking temperature measurements every 15 minutes. Over the entire period, the temperature recorded was an even 11.1°C and never changed more than 0.1°C. This is the same as the current mean annual temperature outside! As each layer is precipitated, it traps isotopes representative of the outside climate at the time. The best climate records on the South Island so far come from stalagmites from Fiordland, the West Coast and Kahurangi- all areas that have mountain effects. Scientists from the University of Otago are examining the possibility that a record from these coastal Otago caves could provide one of the best climate records on the South Island over the last 100 000 years.




Far left: Collecting a drip sample
Left: Restoring muddied formations

Prepared for the Waikouaiti Museum by Nicolas C. Barth (2012) / University of Otago / New Zealand Speleological Society